

## Unit 12. FRP Composite Material And Its Applications



Fibre-reinforced plastic (FRP) (also known as fibre-reinforced polymer) is a composite material made of a polymer matrix reinforced with fibres. Composites are established as an alternative material system to traditional materials such as steel, wood, aluminium and concrete. Bakelite was the first fibre-reinforced plastic.

### Materials used as Fibres in FRP composites

Glass, carbon, basalt or aramid and at times fibres such as paper, wood or asbestos are also used.

### Materials used as Polymers in FRP composites

The polymer used is usually an epoxy, vinylester or polyester thermosetting plastic or phenol formaldehyde resin.

### Manufacturing of FRP Composite Material

FRP involves two distinct processes, the first is the process whereby the fibrous material is manufactured and formed, the second is the process whereby fibrous materials are bonded with the matrix during moulding.

### Applications of FRP in aviation and automobile industry



- Fibre-reinforced plastics are best suited for any design program that demands weight savings, precision engineering, finite tolerances, and the simplification of parts in both production and operation.
- A moulded polymer artefact is cheaper, faster, and easier to manufacture than cast aluminium or steel artefact, and maintains similar and sometimes better tolerances and material strengths.

UPSC Mains 2013 Question related to FRP

What is an FRP composite material? How are they manufactured? Discuss their applications in aviation and automobile industry:



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